5090
Ser 1832.3/L6135
7 Mar 1996

Mr. Cyrus Shabahari
Department of Toxic Substances Control
Region 2
700 Heinz Ave., Suite 200
Berkeley, CA 94710-2737

Subj: PROPOSAL TO DISPOSE OF INVESTIGATIVE DERIVED WASTE FROM IR-07 AND IR-18, HUNTERS POINT ANNEX, SAN FRANCISCO, CALIFORNIA

Dear Mr. Shabahari:

The purpose of this letter is to request DTSC's concurrence on the Navy's plan to dispose of the investigative derived wastes (IDW) from IR-07 and IR-18 which are currently being stored in Building 130. The following paragraphs give a brief history and a rationale for the disposal.

As part of the Navy's ongoing radiation investigation at Hunters Point Annex (HPA), soils within IR-07 and IR-18 have been evaluated, and a multi-agency agreement has been reached that soils are not contaminated. The main issue regarding the soils from IR-07 and IR-18 was the suspicion that they might be contaminated due to the deposition of radioluminescent dials and gauges in the area or due to contaminated sandblast used during the decontamination of naval vessels associated with Operation Crossroads. The elevated activity detected at the two sites was found to be due to naturally occurring radioactive material (NORM) bound in the mineralogy of the soils. The documents that support these findings are the U.S. Environmental Protection Agency's National Air and Radiation Environmental Laboratory (NAREL) report regarding their petrographic analysis of soils from Parcel B (IR-07 and IR-18) dated August 30, 1994, and presented to the Navy through the US EPA letter dated October 24, 1994. (Enclosure (1)), and the Navy's NORM In Soils at IR-07 and IR-18, Parcel B Technical Memorandum dated March 20, 1995, and submitted to you through EFA West letter Ser 09ER1DS/L5091 dated March 27, 1995 (Enclosure (2)). In this letter, a concurrence was sought for no further radiological investigations and no radiological remediations at the two IR sites. Through a Department of Health Services Memorandum dated April 24, 1995, which was forwarded to the Navy on your letterhead dated April 27, 1995, (Enclosure (3)) a concurrence was issued that the "soil samples contain only background quantities of naturally occurring radionuclides, with no indication of enriched radionuclides."

The Navy proposes to dispose of the drums containing the IDW from IR-07 and IR-18 without further radiological screening. The Navy feels that based on the determination and concurrence, as outlined above, that the two sites do not contain radioluminescent dials. The detected activity is due to NORM which should clear the IDW from further radiological screening and it should be cleared for disposal. IDW's from sites IR-1/21 and IR-2 will be screened for radioluminescent dials by Chem-Nuclear in the near future.

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We are in the process of preparing the scope of work for the radiological screening of the IDW. Therefore, it is crucial that we have your concurrence on this matter as soon as possible. It is requested that a response to this proposal be provided in writing by April 5, 1996. If you have any questions regarding this letter, the point of contact is Mr. Dave Song, Code 1832.3, at (415) 244-2561.

Sincerely,

Original signed by:

RICHARD E. POWELL
Lead Remedial Program Mgr. for HPA/TI
By direction of the
Commanding Officer

Encl:
(1) U.S. EPA letter dated October 24, 1994, Petrographic Analysis of Soil in Parcel B.
(2) U.S. Navy letter Ser 09ER1DS/L5091 dated March 27, 1995, Technical Memorandum, Naturally Occurring Radioactive Material in Soils at IR-7 and IR-18, Parcel B at Engineering Field Activity West, Hunters Point Annex, San Francisco, CA, March 20, 1995.
(3) DTSC letter dated April 27, 1995, Response to Technical Memorandum, Naturally Occurring Radioactive Material in Soils at IR-7 and IR-18 Hunters Point Annex.

Copies to:
U.S. Environmental Protection Agency (Attn: Anna-Marie Cook)
California Regional Water Quality Control Board (Attn: Richard Hiett)
NAVSEADET RASO (Attn: LCDR Lino Fragoso)
Mare Island Naval Shipyard (Code 105)
PRC Environmental Management, Inc. (Jim Sickles)
Harding Lawson Associates (David Leland)

Blind copy to (w/ enclosures):
1832, 62.3, 1832.3, 09CMN
Admin Records (3 Copies)
Chron, blue, green
Activity File: HPA (File:L6135DS.DOC) ab

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

OCT 24 1994

Mike McClelland (09AR1MM)
Western Division
Naval Facilities Engineering Command
900 Commodore Drive
San Bruno, CA 94066-2402

Subject: Petrographic Analysis of Soil in Parcel B

Dear Mr. McClelland:

Enclosed please find the final report prepared by the U.S. Environmental Protection Agency's (U.S. EPA) National Air and Radiation Environmental Laboratory (NAREL) regarding their petrographic analysis of soils collected by the Navy in Parcel B. As is detailed in the attached report, U.S. EPA has concluded that the radionucleides detected in the soil samples from Parcel B are in equilibrium with one another indicating that the radiation is naturally-occurring and results from the presence of monazite and zircon minerals in Parcel B soils. Only very minor amounts of radioactivity may be associated with cinder/slag material.

If you should have any questions regarding this report, please contact me at (415) 744-2385 or Steve Dean at (415) 744-1045. In addition, if you should require additional color copies of the plates included in Appendix B, please also give me a call.

Sincerely,

Alydda Mangelsdorf
Remedial Project Manager

Attachment

cc: R. Ramos, WESTDIV
C. Shabahari, DTSC
R. Hiett, RWQCB
A. Brownell, SFDPH
H.D. Chaney, U.S. NRC

ENCL (1)

5090
Ser 09ER1DS/L5091
27 Mar 1995

Mr. Cyrus Shabahari
Department of Toxic Substances Control
700 Heinz Avenue
Building F, Suite 200
Berkeley, CA 94710

SUBJ: TECHNICAL MEMORANDUM, NATURALLY OCCURRING RADIOACTIVE MATERIAL (NORM) IN SOILS AT IR-7 AND IR-18, PARCEL B AT ENGINEERING FIELD ACTIVITY WEST, HUNTERS POINT ANNEX, SAN FRANCISCO, CA, MARCH 20, 1995

Dear Mr. Shabahari:

As an action item from the radiation investigation meeting of February 2, 1995, enclosed is the subject document for your review and concurrence. The technical memorandum combines the results of the radiation investigations performed by PRC Environmental Management, Inc. (PRC) and the results of petrographic analysis of IR-7 and IR-18 soils by the U.S. Environmental Protection Agency. As requested by Mr. Claude C. Goode of California Department of Health Services, enclosed in the technical memorandum is a figure that shows the locations where soil samples were collected for analysis.

The concurrence being sought under this letter is for no further radiological investigations and no radiological remediation at the Submarine Base Area (IR-7) and the Waste Oil Disposal Area (IR-18) at Hunters Point Annex. The technical memorandum is provided as a justification for this concurrence.

Should you have any questions regarding this matter, the point of contact is Commanding Officer, Engineering Field Activity West, Naval Facilities Engineering Command (Attn: Mr. Dave Song, (Code 09ER1DS), (415) 244-3534).

Sincerely,

Original signed by:

RICHARD POWELL
Lead Remedial Project Manager
By direction of
the Commanding Officer

Copies to:
U. S. Environmental Protection Agency (Attn: Ms. Alydda Manglesdorf)
U. S. Environmental Protection Agency (Attn: Ms. Claire Trombadore)
California Regional Water Quality Control Board (Attn: Mr. Richard Hiett)
NAVSTA Treasure Island (Attn: LT Nanette Roberts)

ENCL (2)

5090
Ser 09ER1DS/L5091
27 Mar 1995

SUBJ: TECHNICAL MEMORANDUM, NATURALLY OCCURRING RADIOACTIVE MATERIAL (NORM) IN SOILS AT IR-7 AND IR-18, PARCEL B AT ENGINEERING FIELD ACTIVITY WEST, HUNTERS POINT ANNEX, SAN FRANCISCO, CA, MARCH 20, 1995

City and County of San Francisco (Attn: Ms. Amy Brownell)
National Oceanic & Atmospheric Administration (Attn: Ms. Denise Klimas)
U. S. Fish & Wildlife (Attn: Mr. Jim Haas)
U. S. Department of the Interior (Attn: Mr. Corville Nohava)
California Department of Fish & Game (Attn: Dr. Mike Martin)
Bay Area Air Quality Management District (Attn: Ms. Catherine Fortney)
ATSDR (Attn: Ms. Joan Davis)
San Francisco District Attorney (Attn: Mr. John Cooper)
Port of San Francisco (Attn: Ms. Karen Glatzel)
Bay Area Base Transition Coordinator (Attn: CDR Al Elkins)
California Office of Environmental Health (Attn: Ms. Margy Gassel)
California Department of Health Services (Attn: Ms. Alyce Ujihara)
RAB Member: San Francisco Redevelopment Agency (Attn: Mr. Byron A. Rhett)
RAB Member: Bay Conservation and Development Commission (Attn: Ms. Jennifer Ruffolo)
RAB Member: Business of Hunters Point Shipyard (Attn: Mr. Scott Madison)
RAB Member: Mayor's Hunters Point Shipyard Citizens Advisory Committee (Attn: Mr. Al Williams)
RAB Member: The New Bayview Committee (Attn: Mr. Samuel Murray)
RAB Member: SEED (Attn: Mr. Sy-Allen Browning)
RAB Member: ARC/Arms Control Research Center (Attn: Mr. Saul Bloom)
RAB Member: Law Offices of Leslie R. Katz (Ms. Leslie Katz)
RAB Member: Mr. Nicholas S. Agbabiaka
RAB Member: Ms. Carolyn Bailey
RAB Member: Ms. Silk Gaudain
RAB Member: Ms. Karen Huggins
RAB Member: Mr. Wedrell James
RAB Member: Ms. Ilean McCoy
RAB Member: Mr. Willie Bell McDowell
RAB Member: Mr. Jeffrey Shaw
RAB Member: Mr. David Umble
RAB Member: Ms. Julia Viera
RAB Member: Mr. Charlie Walker
RAB Member: Ms. Caroline Washington
RAB Member: Ms. Gwenda White
RAB Member: Mr. Michael Harris
PRC Environmental Management, Inc. (Attn: Mr. Jim Sickles)
Harding Lawson Associates (Attn: Mr. David Leland)

5090
Ser 09ER1DS/L5091
27 Mar 1995

SUBJ: TECHNICAL MEMORANDUM, NATURALLY OCCURRING RADIOACTIVE MATERIAL (NORM) IN SOILS AT IR-7 AND IR-18, PARCEL B AT ENGINEERING FIELD ACTIVITY WEST, HUNTERS POINT ANNEX, SAN FRANCISCO, CA, MARCH 20, 1995

Blind copies to (w/ enclosure):
09ER1, 62.3, 09ER1DS, 09ER1WR, 09ER1WM, 09CMN
Admin Records (3 Copies)
Chron, blue, green
Activity File: HPA (File: L5091DS.DOC)

CLEAN

Contract No. N62474-88-D-5086

Contract Task Order No. 155

Navy Engineer-in-Charge: David Song
PRC Project Manager: David Preston
PRC Task Manager: David Martinez

ENGINEERING FIELD ACTIVITY WEST
NAVAL FACILITIES ENGINEERING COMMAND
HUNTERS POINT ANNEX
SAN FRANCISCO, CALIFORNIA

NATURALLY OCCURRING RADIOACTIVE MATERIAL IN SOILS AT IR-07 AND IR-18 PARCEL B

TECHNICAL MEMORANDUM

Prepared By

PRC ENVIRONMENTAL MANAGEMENT, INC.
135 Main Street, Suite 1800
San Francisco, CA 94105
(415) 543-4880

March 20, 1995

1.0 INTRODUCTION

PRC Environmental Management, Inc. (PRC) is conducting a three-phase environmental radiation investigation at Hunters Point Annex (HPA), San Francisco, California. This investigation is under the Comprehensive Long-Term Environmental Action Navy (CLEAN) Contract N62474-88-D-5086, Contract Task Order (CTO) Number 0155, on behalf of the Department of the Navy, Engineering Field Activity West (EFA WEST), Naval Facilities Engineering Command.

The purpose of this technical memorandum is (1) to address the presence of naturally occurring radioactive materials found in fill dirt at the Waste Oil Disposal area (IR-18) and the Submarine Base Area (IR-07) within Parcel B at HPA and (2) to provide justification for no further radiological investigation at the sites.

2.0 SUMMARY

Radiation surveys performed during the 1991 Surface Confirmation Radiation Survey (SCRS) at HPA, identified two areas within Parcel B that contain soils which emit elevated gamma count rates (PRC 1992). These areas include the Submarine Base Area (IR-07) and the Waste Oil Disposal Area (IR-18). Gamma count rates from soils there were measured to be more than one-and-one-half times that of expected facility-wide background. Soil samples collected from IR-18 contained approximately 5.0 picocuries per gram (pCi/g) radium-226 (^{226}Ra). The decay of ^{226}Ra produces radon (^{222}Rn) gas.

Radiation surveys performed during the SCRS indicate that the soil does not emit significant amounts of radon gas. Radon flux rates at the site were found to be consistent with HPA background levels. Gamma exposure rates at the site are consistent with facility-wide background gamma exposure rates at HPA.

In 1994, petrographic and radiometric analysis of the soil was completed by the U.S. Environmental Protection Agency (EPA), National Air and Radiation Environmental Laboratory (NAREL). The soil was found to contain minerals with naturally occurring radioactive isotopes of the uranium and thorium decay series. These radioactive materials, including radium-226, were naturally incorporated

into the mineralogy of monazite and zircon and have not been depleted or enhanced by any manufacturing process (EPA 1994). The soil does not contain fission products (plutonium and cesium) associated with decontamination related activities from Operation Crossroads. Based on its mineralogy, it appears that the soil was imported from another location in California for use as fill dirt at HPA.

3.0 PROJECT HISTORY

IR-07 and IR-18 were surveyed during the first phase of radiation investigations at HPA conducted in 1991. During the SCRS, facility-wide background levels for gamma count rates, ^{226}Ra soil concentrations, gamma exposure rates, and radon flux rates were established.

The SCRS identified areas within IR-07 and IR-18 that contained soils that emitted elevated gamma count rates. Gamma count rates from these soils were measured to be more than one-and-one-half times that of expected facility-wide background. Soil samples collected from these locations were found to contain approximately 5.0 pCi/g ^{226}Ra. The expected background level of ^{226}Ra for soils at HPA, in soils derived from the Franciscan Complex, and soils found in the San Francisco Bay Area, is approximately 0.5 pCi/g.

Gamma exposure rates measured at IR-07 and IR-18 ranged between 5 and 9 microroentgen per hour (μR/hr) at 3 feet above ground surface. Facility-wide background gamma exposure rates, established during the SCRS, ranged from 4.4 to 9.5 μR/hr with an average of 7.8 μR/hr using a Reuter/Stokes pressurized ionization chamber (PRC 1992).

Radon flux rates measured at IR-07 were less than 0.30 picocuries per square meter per second (pCi/m^2/sec) (PRC 1992). This level is over 60 times lower than EPA's maximum allowable radon flux rate standard of 20 pCi/m^2/sec (EPA 1978). This standard is applied primarily to regulate construction of residential buildings over uranium mill tailings that contain ^{226}Ra. The radon flux rates at HPA were representative of those found in typical soil in the San Francisco Bay Area. Facility-wide background radon flux rates at HPA, established during the 1992 SCRS, ranged from 0.01 to 1.12 pCi/m^2/sec (PRC 1992).

Soils that exhibit elevated gamma count rates in IR-07 and IR-18 are restricted to an area approximately 100 feet wide by 400 feet long on the hillside immediately northeast of building 916. The hillside is topped by Donahue Street. The level portions of IR-07 and IR-18 are adjacent to each other. They are approximately 25 feet below Donahue Street and are paved with asphaltic concrete.

During the 1940s and 1950s, the Navy created the flatland area of IR-07 and IR-18 by filling in the northern bay margin during its activities at the shipyard. Many buildings that were constructed on this fill have since been demolished. IR-07 was originally used by the Navy in support of submarine maintenance, as an area for sandblast grit disposal, industrial landfill operations, and painting. IR-18 was designated as a Triple A contamination site. Waste oil spread over the soil surface was paved over with asphaltic concrete. IR-18 was last used as a recreational vehicle campground and parking lot.

At the time the SCRS was conducted, concern existed that elevated gamma count rates at IR-07 and IR-18 were possibly the result of radioactive contamination from sandblast waste from decontamination efforts following Operation Crossroads. In late 1946, nuclear weapon tests were conducted near Bikini Atoll in the Marshall Islands. These tests were known collectively as Operation Crossroads (Cook 1988). Ships were returned to HPA drydocks after Operation Crossroads for decontamination studies after they were found to be resistant to radiological decontamination techniques that employed water blasting. Many methods of decontamination were tried before sandblasting was determined to be the only method that satisfactorily removed the contamination (Weisgall 1994). It has been postulated that fallout particles, including cesium-137 and plutonium-239, may have been mixed with sandblast wastes that were generated during Operation Crossroads decontamination activities. No scientific proof or documentation indicates these materials were disposed of at HPA.

Navy documentation has established that all radioactive sandblast waste material and radioactive hull scrapings, generated from decontamination, were properly packaged and disposed of by ocean dumping. During 1946 and 1947, radioactive wastes from these activities were dumped in an approved zone near the Farallon Islands, 25 to 40 miles offshore from San Francisco (U.S. Navy 1949). Soil samples collected during the SCRS were analyzed for mixed fission products and

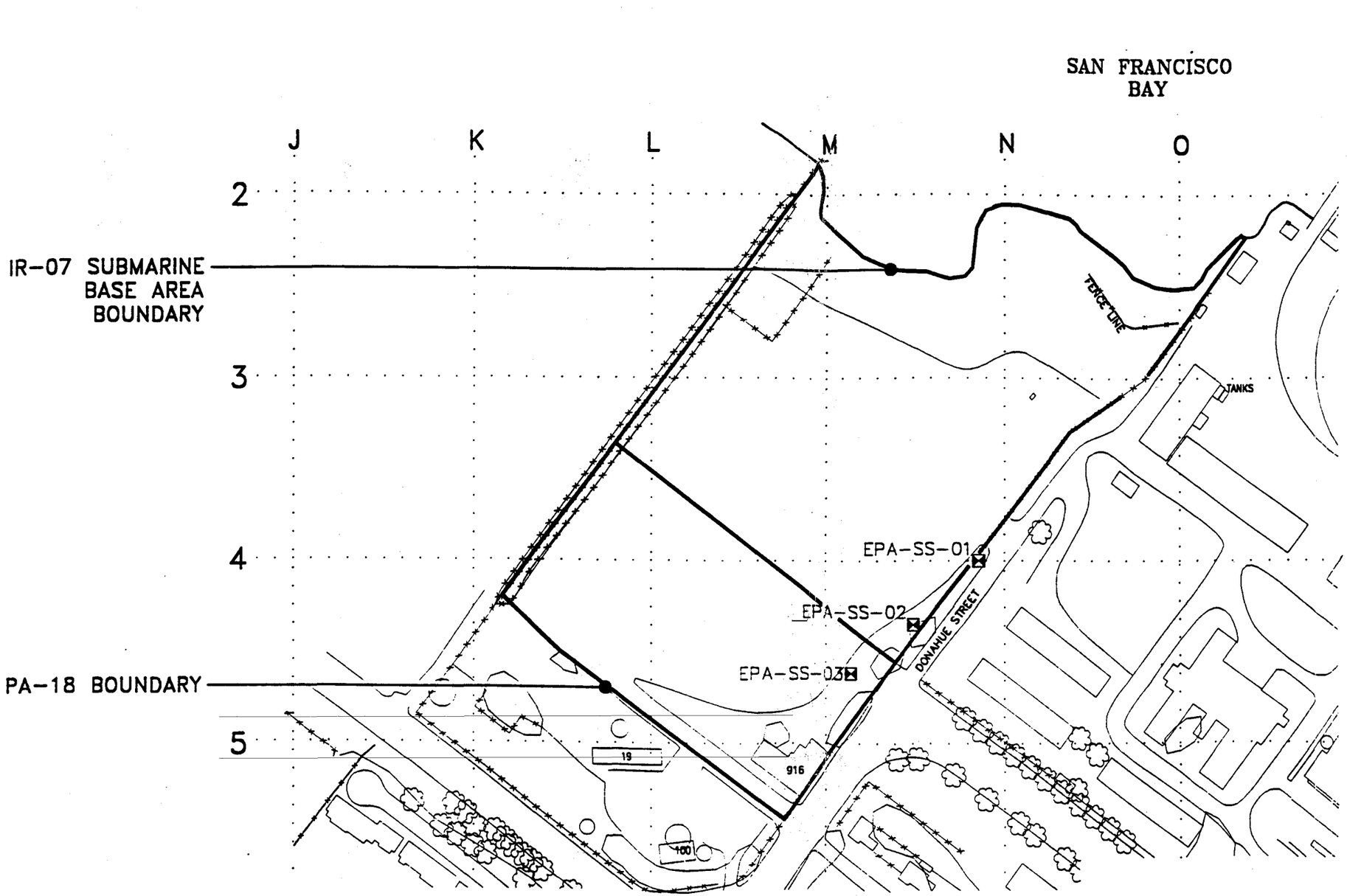
plutonium. Mixed fission products and plutonium in soils were not detected in concentrations above normally expected background levels associated with worldwide atmospheric fallout (PRC 1992).

4.0 EPA PETROGRAPHIC ANALYSIS OF SOILS AT IR-07 AND IR-18

In 1994, after the SCRS was completed, the EPA collected soil samples from IR-07 and IR-18 for petrographic and radiological analysis. The figure on the next page shows locations where the three samples were collected. The analyses were performed to identify the source of elevated gamma count rates emitted by soils at the site. Three soil samples were collected and sent to EPA NAREL, in Montgomery, Alabama. The soil's mineralogy (particle size, mineral type, and other physical characteristics) was established using petrographic analysis; its radioisotopic constituents were identified by gamma spectroscopic analysis. These two techniques, when used together, give a detailed classification of soil radioactivity by particle size, mineral type, and radioisotope.

EPA petrographic analysis shows that the soils contain background quantities of uranium, thorium, and radium. Based on the mineralogy of the sand fraction that was described in the EPA NAREL report, zircon and monazite appear to account for most of the observed radioactivity (EPA 1994). These minerals are somewhat distinctive and would not generally be associated with sands derived from serpentinite or other rocks that outcrop in the vicinity of Hunters Point. Both monazite and zircon tend to be associated with granitic intrusive rocks, particularly pegmatites (Deer, Howie, and Zussman 1966).

These distinctive minerals suggest that the sand is not of local origin and was imported, from another locality some distance away, for use as fill. Possible source areas for monazite-containing sands would be the Salinian basement rock on the west side of the San Andreas fault and the granitic intrusives of the Sierra Nevada.



LEGEND

⊠EPA-SS-01 EPA SOIL SAMPLE LOCATION

0 100' 200' 300' 400'

SCALE 1" = 200'

FIGURE
LOCATION OF EPA SOIL SAMPLES
AT IR-07 AND PA-18
HUNTERS POINT ANNEX
SAN FRANCISCO, CALIFORNIA

REFERENCES

Cook, C.S. 1988. The Legacy of Crossroads, Naval History (periodical). Fall.

Deer, Howie, and Zussman. 1966. An Introduction to the Rock-Forming Minerals.

PRC Environmental Management, Inc. (PRC). 1992. Surface Confirmation Radiation Survey, Naval Station Treasure Island, Hunters Point Annex San Francisco, California.

U.S. Environmental Protection Agency (EPA). 1978. Standards for Protection Against Uranium Mine Tailings, U.S. Code of Federal Regulations, Title 40, Subpart 192.

EPA. 1994. Hunters Point Annex - Parcel B. Radiological and chemical support center. EPA contract No. 68D20155. Sanford Cohen and Associates.

U.S. Navy. 1949. Radiological Decontamination of Non-target Vessels, Operation Crossroads Joint Task Force One, 3 vols. Aprii.

Weisgall J.M. 1994. Bikini, Proceedings, Naval Institute Press Book Adaptation. February.

CALIFORNIA — ENVIRONMENTAL PROTECTION AGENCY
RTMENT OF TOXIC SUBSTANCES CONTROL
AVE., SUITE 200
CA 94710-2737

PETE WILSON, Governor

April 27, 1995

Recd 5/2/95 DS

Mr. David Song
Engineering Field Activity, West
Mail Code 09RDS
900 Commodore Way
San Bruno, California 94066-0720

RESPONSE TO TECHNICAL MEMORANDUM, NATURALLY OCCURRING RADIOACTIVE MATERIAL IN SOILS AT IR-7 AND IR-18 HUNTERS POINT ANNEX

Dear Mr. Song:

The enclosed memorandum form the Department of Health Services (DHS) is forwarded for your consideration. To release the property for unrestricted use, a separate letter needs to be submitted to the DHS for that purpose.

Should you have any questions regarding this letter, please call me at (510) 540-3821.

Sincerely,

Cyrus Shabahari
Project Manager
Office of Military Facilities

Enclosure

cc: US EPA
Region IX
Attn: Claire Trombadore
Mail Code H-9-2
75 Hawthorne Street
San Francisco, California 94105

ENCL (3)

cc: Mr. Donn Diebert
Office of Military Facilities
Department of Toxic Substances Control
Region 1 10151 Croydon Way, Suite 3
Sacramento, CA 95827

Mr. John Adams
Division of Clean Water Programs
State Water Resources Control Board
2014 T Street, Suite 130
P.O. Box 944212
Sacramento, California 94244-2120

Mr. Claude Goode
Department of Health Services
Environmental Management Branch
601 North 7th Street (MS 396)
P.O. Box 942732
Sacramento California 94234-7320

Mr. Richard Heitt
Regional Water Quality Control Board
Region 2
2101 Webster Street, Suite 500
Oakland, CA 94612

Department of Health Services Comments on
Naturally Occurring Radioactive Material in Soils
at IR–07 and IR–18 Parcel B, Technical Memorandum
Hunters Point Annex

Background:

Previously, we reviewed the abstract of the soil sample study (prepared by the National Air and Radiation Environmental Laboratory). Our comments were relayed to you in a February 21, 1995, memo.

The abstract was submitted as a part of an Environmental Baseline Survey (EBS) and final report (relative to issuance of a Finding of Suitability to Transfer) to determine if the radionuclide activity in parcel B is from natural radiation sources and/or if it is sufficiently low to permit the parcel to be released for unrestricted use.

The abstract, as submitted, identified the methods of sample preparation and results of the studies done to identify the type and nature of radionuclides in the soil samples from Parcel B. However, it lacked information relative to the specific sampling sites.

We have not yet received an official request to release Parcel B for unrestricted use. Also, we have not received a final remediation investigative report.

Comments:

1. The current document adequately identifies the specific sampling sites within Parcel B.

2. Sampling techniques are assumed to have been completed within acceptable standards established in the earlier document's references.

3. After reviewing the data received, we concur with the conclusion that the soil samples contain only background quantities of naturally occurring radionuclides, with no indication of enriched radionuclides. Also, in accordance with US EPA Health Effects Assessment Summary (January 1992), the quantities are within the range of 10^{-6} to 10^{-5} lifetime cancer risk levels, as determined in picocuries/gram of soil, and may be considered as a minimal cancer risk.

4. Following our acceptance of the technical findings, an official request for release of Parcel B for unrestricted use classification would be appropriate. We assume that a Final Remedial Investigative report, with the request for Parcel B to be released for unrestricted use, will be forthcoming.

Comments prepared by:

Mr. Claude Goode
Associate Health Physicist
Environmental Radiation Program
Environmental Management Branch
Department of Health Services
(916) 445-4408